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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/745,363	12/21/2000	Andrew Kostrzewski	100.232	2371

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EXAMINER
SHERALI, ISHRAT I

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/745,363	Kostrzewski et al.
Examiner	**Art Unit**
Ishrat Sherali	2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *May 28, 1997* .

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *5-13 and 32-56* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) *50-55* is/are allowed.

6) ☒ Claim(s) *5-13, 32-49, and 56* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Restriction

1. Applicant's election of Group I, claims 5-13 and 32-56 without traverse in paper no. 11 is acknowledged. Restriction requirement is made Final.

Specification

2. Specification is objected because in the specification in pages 1, 3-4, 8-9, 11-15, 20, 32, 44-49, 55, 65-70, 73-78 and 82 there are permanent marks present. Applicant is required to provide replacement pages.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 36, 40 and 43- 45, are rejected under *35 USC § 112* as being indefinite for failing to particularly point out and distinctly claim the subject matter.

5. Regarding claims 36, 40 and 43-45, claims shows various relationship using variables. Claims 36, 40 and 43-45 are indefinite because limitations fail to spell out what these variable stand for.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> > (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 5-13 and 32-39, 46-49 and 56 are rejected under 35 USC § 102 (e) as being anticipated by Jacobs et al. (US 5,862,262).

Regarding claim 5, Jacobs discloses identifying at least one catastrophe in image (See Jacobs, figure 2, col. 4, lines 12-15, Jacobs is identifying at least catastrophe in image by defining digital image as plurality of points [discrete points/structure] having x,y,z coordinates, catastrophe is defined in the specification as discrete structure/points in page 18, lines 9-10);

representing catastrophe with canonical polynomial (See Jacobs, col. 4, lines 12-15, Jacobs is representing catastrophe [discrete structure/point] with x, y, z coordinates and these coordinate represent canonical polynomial, canonical polynomial is defined in the specification as simplest

polynomial in page 17, lines 16-18 and figure 2 in Jacobs shows x, y, z coordinates as polynomial representing area in the image);

transforming canonical polynomial into datery (See Jacobs, figure 2, col. 4, lines 39-45, Jacobs shows mapping process in which x,y,z coordinates system is used to define a domain Di which is subset of area of the image, polynomial/function f(x, y,z) representing the sub area of the image is equivalent transforming canonical polynomial into datery [area]).

Regarding claim 6, Jacobs discloses representing a region of abrupt changes in pixel intensity in still image with a canonical polynomial (See Jacobs, 42-44, Jacob representing a region of abrupt changes in pixel intensity in still image with a canonical polynomial by representing in the image gray level of a pixel at the point [x,y] with function f[x y z] i.e Jacobs shows discrete points of gray level [abrupt changes in pixel intensity]).

Regarding claim 7, Jacobs discloses segmenting the image into block of pixels (See Jacobs, col. 4, lines 11-15, Jacobs shows segmenting the image into block of pixels);

creating a canonical polynomial surface for at least one catastrophe in at least one of said block of pixels (See Jacobs, figure 2, col. 4, lines 38-45, Jacobs discloses creating a canonical polynomial [f {x, y, z}] surface for at least one catastrophe [discrete structure] in at least one of said block of pixels);

sending the coefficient of at least one canonical polynomial as compressed data (See Jacobs, col. 4, lines 30-35, Jacobs shows sending the encoded image as information defining the

domain [Di] and in figure 2 and col. 4, lines 38-44, Jacobs shows Di represent coefficients [x, y, z] which is a function [polynomial] defining sub area of the image).

Regarding claim 8, Jacobs discloses identifying at least one isomorphic singularity in image by applying photometric projection to image (See Jacobs, col. 3, lines 25-30, Jacobs is identifying isomorphic singularity in image by applying photometric projection to image by describing image as discrete three-dimensional [x , y, z] and it is photometric projection because z represent intensity or luminance, isomorphic singularity is defined in the specification in page 44, lines 4-6, 3-D object boundary);

characterizing at least one isomorphic singularity with at least one polynomial (See Jacobs, figure 2, col. 4, lines 38-45, Jacobs shows characterizing at least one isomorphic singularity with at least one polynomial [function]).

Regarding claim 9, Jacobs discloses creating a model surface of image with at least one polynomial (See Jacobs, figure 2, col. 4, lines 38-45, Jacobs discloses creating a model surface of image with at least one polynomial [function]),

model surface being isomorphically related to image (See Jacobs, col. 4, lines 45-55, Jacobs shows that model surface Di is mapped to Ri [image] i.e by transformation model Di is ismorphically [one to one mapping] related with Ri [image]).

Regarding claim 10, Jacobs discloses transmitting the coefficients of at least one polynomial as compressed data (See Jacobs, col. 4, lines 30-35, Jacobs shows sending the encoded image as

information defining the domain [Di] and in figure 2 and col. 4, lines 38-44, Jacobs shows Di represent coefficients [x, y, z] which is a function [polynomial] defining sub area of the image).

Regarding claim 11, Jacobs discloses modelling the image as photometric projection of at least one manifold in image (See Jacobs, col. 3, lines 25-30, Jacobs discloses modelling the image as photometric projection of at least one manifold in image by describing image as discrete three-dimensional [x , y, z] and it is photometric projection because z represent intensity or luminance of pixel or discrete point);

mapping at least one manifold in coordinate (x, y, B) where B is luminance at each point (x,y) (See Jacobs, col. 3, lines 25-30 Jacobs shows mapping at least one manifold in coordinate (x, y, B [z]) where B [z] is luminance [intensity at each point) ;

characterizing the mapping with a polynomial (See Jacobs, figure 2, col. 4, lines 38-45, Jacobs shows characterizing mapping with one polynomial [function]).), polynomial having coefficients (See Jacobs, col. 5, lines 30-35, polynomial [function] Di as shown in figure 2 having coefficients) ;

sending the coefficient of the polynomial as compressed data (See Jacobs, col. 4, lines 30-35, Jacobs shows sending the encoded image as information defining the domain [Di polynomial/function] and in figure 2 and col. 4, lines 38-44, Jacobs shows Di represent coefficients [x, y, z] which is a function [polynomial] defining sub area of the image).

Regarding claim 12, Jacobs discloses coordinate B (x,y,B) does not introduce new singularities (See Jacobs, col. 3, lines 25-30, coordinate B [z] luminance/luminance does not

introduce new singularity because it is describing the intensity/luminance of same discrete point [x, y]) .

Regarding claim 13, Jacobs discloses describing the shape of object in image in polynomial form (See Jacobs, figure 2, col. 6, lines 35-40, Jacobs shows describing the shape [geometry] of object in image in polynomial [function] form).

Regarding claims 32-33 and 35, Jacobs discloses model image is generated from canonical polynomial which is best match selected based on the difference a difference between the image and model (See Jacob, col. 3, lines 43-55, model image is generated from canonical polynomial which is best match selected based on the difference a difference between the image and model).

Regarding claims 34 and 37, Jacobs discloses selecting polynomial coefficients based upon image quality (See Jacob, col. 3, lines 43-55, polynomial coefficients are selected based upon image quality of model image and original image).

Regarding claim 36, Jacobs discloses difference is calculated using the RMS equation (See Jacob shows RMS equation in col. 3, lines 60).

Regarding claim 38, Jacobs discloses object boundaries comprises isomorphic singularity (See Jacobs, col. 3, lines 25-30, Jacobs shows object boundaries comprise isomorphic singularity by describing image boundary as discrete three-dimensional [x , y, z] points).

Regarding claim 39, Jacobs discloses polynomial is selected from the table (See Jacobs, col. 5, lines 22-40, Jacob shows polynomial is selected based on equation 5, by which table can inherently generated)

Regarding claim 46, Jacobs discloses characterizing image with singular manifold representation (See Jacobs, col. 3, lines 25-30, Jacobs shows characterizing the image singular manifold representation by describing the image as discrete three-dimensional [x , y, z] points).

Regarding claims 47, Jacobs discloses aspects are surfaces of object (See Jacobs, col. 6, lines 35-37, aspects are surface [geometry] of object).

Regarding claim 48, Jacobs discloses singular manifold representation are represented by canonical polynomials (See Jacobs, figure 2, col. 4, lines 38-43, singular manifold representation are represented by canonical polynomials [Di]).

Regarding claim 49, Jacobs discloses reducing polynomials to compact tabulated form which comprises simple number (See Jacob, col. 5, lines 25-40, Jacob shows reducing polynomial to simple number).

Regarding claim 56, Jacobs subdividing an image (See Jacobs, col. 4, lines 12-20, Jacobs shows subdividing the image into sections);

creating a canonical image of each block by finding the best match between the polynomial and intensity distribution for each block of pixels by using merit function (See Jacobs, col. 3, lines 45-55, See Jacob shows creating a canonical image of each block by finding the best match between the polynomial and intensity distribution for each block of pixels by using merit function),

creating a model image comprised of canonical images and fining connection between neighboring block of pixels thereby smoothing out the intensity (See Jacobs, col. 6, lines 35-40 Jacobs creating a canonical model image by partitioning the Domain [model image] describing the

geometry and col. 42-45, Jacob is smoothing the model image [domain] by further partitioning the domain blocks);

recapturing the lost high frequency by subtracting model image and original image (col. 3, line 55, Jacob show subtracting model image and original image)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 40-45, are rejected under 35 USC § 103 as unpatentable over Jacobs et al. (US 5,862,262).

Regarding claim 40, Jacobs shows describing polynomial (See Jacobs, figure 2, col. 6, lines 35-37).

Jacobs however has not explicitly shown the table of canonical polynomials. However in col. 6, lines 35-37, disclose the polynomial is based on the geometry of partitioned blocks of model image and original image. Therefore it would have be obvious to one having ordinary skill in the art to use the polynomials listed in table because polynomial depends on the geometry or shape of the partitioned model image.

Regarding claims 41-42, Jacobs discloses transformation is applied to selected canonical polynomial to obtain a function describing a model surface (See Jacob, col. 6, lines 35-38, Jacob shows transformation is applied to selected polynomials) and transformation is non-homogenous linear transformation (See Jacob, col. 6, lines 35-40).

Regarding claims 43-44, Jacobs has not explicitly shown the form of transformation shown in claims 43-44, however Jacobs shows transformation and using the transformation type is a design and does not carry patentable weight.

Regarding claim 45, Jacob discloses wherein quality determination is calculated using the difference between original and model segments (See Jacobs, col. 3, line 60)

Allowable Subject Matter

10. Claims 50-55 are allowable over prior art of record.

Contact Information

11. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Ishrat Sherali whose telephone number is (703)-308-9589. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone number are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the

organization where this application or proceeding is assigned are (703) 872-9314 for regular communication.

Any inquiry of a general nature relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Ishrat Sherali

Patent Examiner

Group Art Unit 2621

September 3, 20002

PHUOC TRAN
PRIMARY EXAMINER